

A Study of AIGC-Assisted Teaching Reform Practices in Fashion Design Courses Based on Symbiosis Theory: Taking the Fashion Brand and Product Planning Course as an Example

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Abstract: With the rapid penetration and widespread adoption of generative artificial intelligence (AIGC) as an auxiliary tool in design practice within the textile and apparel industry, AI-assisted design has become an important tool and a future development direction for fashion brand product development. However, in the teaching of fashion design courses in higher education, some students' dependence on and improper use of AI-assisted tools have led to problems such as fragmented tool application, blurred boundaries of design agency, and inertia in innovative thinking. This paper aims to explore how AIGC technology can be effectively integrated into the teaching practice of the Fashion Brand and Merchandise Planning course. Based on symbiosis theory, it constructs a teaching reform pathway and implementation mechanism for the AI-assisted Fashion Brand and Merchandise Planning course. The study shows that the four-stage symbiotic teaching pathway, comprising market decoding, brand co-construction, merchandise translation, and feedback iteration, can effectively improve students' integrated competence in brand planning, human-AI collaboration ability, and awareness of reflection and optimization. To a certain extent, it can also mitigate the negative impact of AIGC misuse on students' original thinking and planning judgment. This study has important theoretical value and practical significance for regulating the methods and boundaries of AIGC use in related courses and for cultivating interdisciplinary fashion design talent.

Keywords: symbiosis theory; Fashion Brand and Merchandise Planning course; AIGC technology; teaching reform practice

1. Introduction

In recent years, the rapid breakthroughs of generative artificial intelligence (AI) technology and its deep integration with industry have gradually pushed the global economy and society into an era of digital transformation and intelligent innovation under Industry 4.0. Today, AIGC is no longer a proof-of-concept technology or a peripheral tool; rather, it has become a core engine deeply embedded in design processes and reshaping the modes of creative production. It is regarded as a key component of the fashion industry's "new quality productive forces" ^[1]. Against this macro-level transformation, fashion brand planning and product development—as a key link in the fashion industry chain that connects market insight, design creativity, and communication expression—have also become an important field for the deep involvement of AIGC. However, in the teaching practice of the *Fashion Brand and Merchandise Planning* course in higher education, the introduction of AIGC has not automatically translated into improved teaching quality. On the contrary, due to students' dependence on AI-assisted tools, insufficient embedding of AI applications into the course task chain, and unclear positioning of teachers' instructional roles, problems have emerged, including blurred design agency, weakened planning judgment, and distortion in market research and information verification. As a result, the course faces new teaching challenges in key links such as brand-logic construction, product-structure deduction, and communication and feedback optimization.

At present, the development and planning of fashion brands are showing a shift from experience-based judgment to data insight and intelligent assistance, from one-way planning to human-AI collaborative co-creation, and from static presentation to an interactive digital communication and feedback loop ^[2]. If related courses in some Chinese fashion colleges merely treat AIGC as a tool for improving efficiency, without establishing reasonable teaching organization and value constraints, this

may lead to deviations in teaching objectives such as “being able to generate but unable to plan” and “being able to express but unable to judge,” as well as the risk of design fixation [3]. Therefore, it is necessary to examine approaches to teaching reform when AIGC is embedded in the course design process and to explore effective teaching pathways for its application in fashion brand planning courses.

Current research hotspots on generative artificial intelligence (AIGC) in design education mainly focus on three directions: “cultivating GenAI literacy and prompt literacy” [4], “human-AI collaborative innovation and the reconstruction of learning paradigms” [5], and “updates to course mechanisms, evaluation systems, and ethical boundaries” [6]. Most of these studies address students’ critical evaluation ability and the construction of a five-dimensional integrated GenAI literacy system after AIGC is incorporated into design courses [7][8], the construction of a “human-intelligence collaborative education” model guided by collaborative value and co-generation [9], the exploration of intervention-oriented autonomous human-AI collaborative learning pathways and processes [10][11], and the numerous risks brought by AI-assisted learning in design courses, such as creative inertia, design fixation, excessive dependence, value deviation, and resource constraints [12]. By contrast, research on teaching reform for the *Fashion Brand and Merchandise Planning* course has mainly focused on industry-education integration and collaborative education, local culture, and value guidance. There are very few studies on how AIGC empowers the instructional design and auxiliary pathways of this type of course. Although studies on the application of symbiosis theory in design disciplines in the age of artificial intelligence have begun to appear, most remain at the macro-theoretical level of interpreting the reconstruction of human-machine relations, the logic of digital-physical symbiosis, and product development strategies. Based on this, this paper takes the *Fashion Brand and Merchandise Planning* course as an example and introduces symbiosis theory in an attempt to construct a four-stage double-diamond teaching pathway: market decoding, brand co-construction, merchandise translation, and feedback iteration. It explores effective ways of embedding AIGC into courses related to fashion brand and merchandise planning, with the aim of providing transferable practical references for the digital-intelligent reform of such courses in university fashion design programs.

2. Teaching Status and Problems of AIGC Intervention in the *Fashion Brand and Merchandise Planning* Course

With the continuous advancement of AI-driven digital and intelligent transformation in design education and collaborative education through industry-education integration, generative AI tools have gradually entered the teaching scenarios of the *Fashion Brand and Merchandise Planning* course. They have been incorporated into instructional design through real industry project-based study, virtual simulation, digital communication, and other approaches. Course implementation is no longer confined to traditional lecture-based knowledge transmission; instead, it increasingly emphasizes teaching organization guided by authentic tasks, industrial contexts, and the cultivation of comprehensive practical abilities. At present, the intervention of AIGC in the teaching of the *Fashion Brand and Merchandise Planning* course has a clear practical foundation. However, the new technology also creates an evident tension among three factors: “improved technological efficiency,” “students’ subjective understanding of tools,” and “the course objective of cultivating innovative thinking.”

Based on preliminary classroom observation, questionnaire surveys, and a review of relevant literature, this paper systematically analyzes the teaching status and existing problems of AIGC intervention in the *Fashion Brand and Merchandise Planning* course from four levels: technological application, student cognition, thinking guidance, and teaching mechanisms (Table 1).

Table 1. Problem levels, manifestations, and impacts in AIGC-assisted teaching of the *Fashion Brand and Merchandise Planning* course.

Problem level	Existing problem	Specific manifestation	Teaching impact
Technological application level	Efficiency improvement coexists with insufficient full-process application	AI is mainly used in the front end of design for image generation, revision, and framework building	It is difficult to touch the core competence training of brand planning
Student cognition level	Imbalance between understanding of tool attributes and positioning of the creative subject	Students mistakenly treat AI as the source of creativity	Original awareness and subjective judgment are weakened

Thinking guidance level	Conflict between rapid generation and the complete design-thinking chain	Research, analysis, deduction, and revision are omitted	Cultivation of innovative thinking deteriorates
Teaching mechanism level	Tools have entered the classroom, but institutional support lags behind	A lack of resource libraries, norms, cases, and evaluation feedback loops	AI integration in teaching remains fragmented

2.1. Technological application level: AIGC has widely penetrated key course links and is highly active in visual generation, copywriting assistance, and preliminary data integration.

In terms of technology acceptance and usage behavior, AIGC tools are already being used frequently and widely among design students. In 2025, *China Youth Daily* launched a questionnaire survey on the use and attitudes of AI tools among university students nationwide. Among more than 3,000 responses, 99.2% of the respondents said they were using AI, and 65.9% believed that AI tools had surpassed traditional search engines to become the preferred channel for university students to obtain information [13]. In their latest study, Chinese scholars Song and Wang used the UTAUT model to survey 487 Chinese design-college students. The results showed that more than 60% of design students had used AI image-generation software, mainly for data collection (such as research data), design ideation (such as the brainstorming stage), and conceptual creativity [14]. A research team from Zhejiang Sci-Tech University (2025) found that fashion design students in China generally hold a high level of satisfaction with AI-integrated design platforms. The team verified students' continued intention to use generative AI platforms from three perspectives—usage intention, social influence, and technology and habit—and the results showed significant positive driving effects [15].

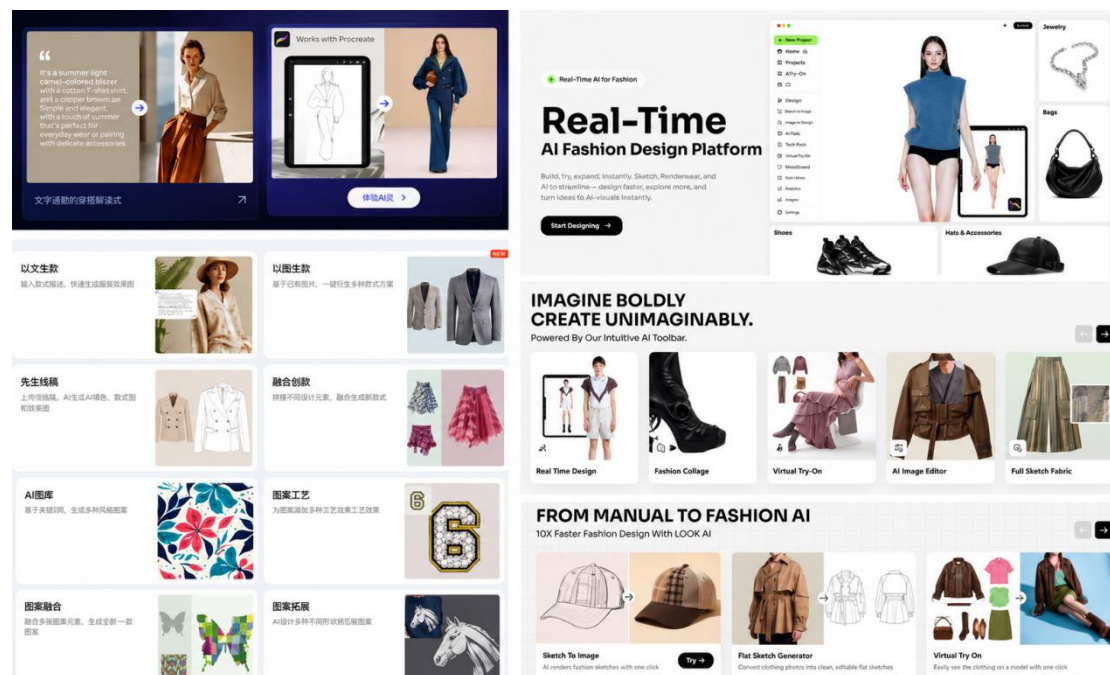


Figure 1. Operation interfaces of LOOKAI and Style3D iCreate AI-assisted tool software.

Current AIGC-assisted design software in the fashion industry can be divided into two categories: creativity-inspiring tools (divergent) and design-assisting tools (convergent). The former mainly serve inspiration, conceptual association, and style exploration, while the latter focus more on rendering design effects, extending styles, making local revisions, and optimizing visuals on the basis of existing design intentions. Taking Midjourney, LOOKAI, Stable Diffusion, Style3D iCreate, and similar software as examples, most of these auxiliary tools use multimodal diffusion-model technology integrating text and images to generate images from text or from images (Figure 1). The author conducted a questionnaire survey among teachers and students in the womenswear design direction at Beijing Institute of Fashion Technology regarding the use of AIGC-assisted learning in the *Fashion Brand and Merchandise Planning* course. A total of 58 valid questionnaire samples were collected. The survey found that students used AI drawing tools and AI copywriting-generation functions at relatively

high rates in class, reaching 72.4% and 67.2% respectively (Figure 2). Across all modules of the *Fashion Brand and Merchandise Planning* course, students generally believed that AI was more useful in the classroom for “rapid iteration and optimization of design schemes” and for “extracting and expanding inspiration for product themes and design elements” (Figure 3). The survey results reveal students’ logic in using AIGC-assisted design functions in class: they prefer a controllable mode of interaction and a basic usage logic characterized by “creative inspiration-driven input–line-drawing-to-image generation as the main approach–enhanced visual presentation–manual correction as supplementation.”

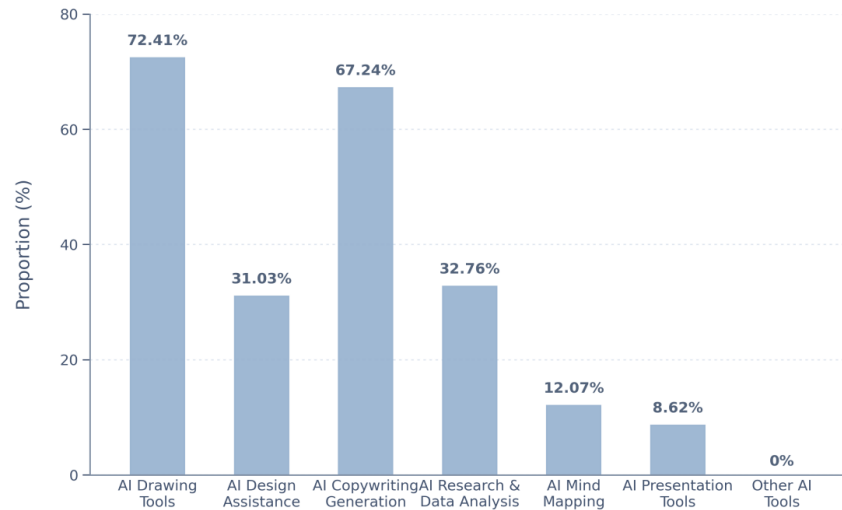


Figure 2. Proportion of students using different types of AI tools in the *Fashion Brand and Merchandise Planning* course.

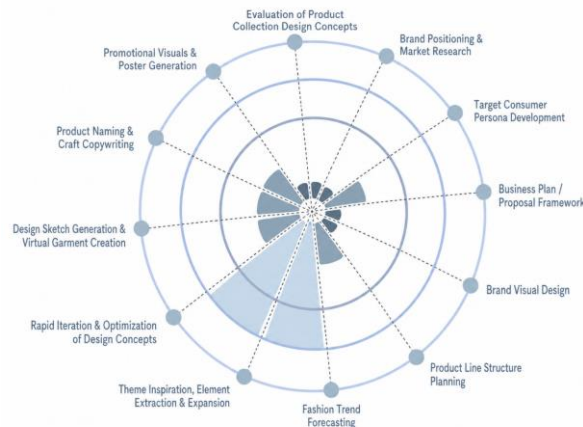


Figure 3. Proportion of students’ evaluations of the usefulness of AI assistance in each stage of the *Fashion Brand and Merchandise Planning* course.

At the same time, AIGC technology still has bottlenecks in the expression of fashion details, which affects students’ learning and usage experience. Specifically, these bottlenecks include insufficient professional control over garment craftsmanship details and inaccurate pattern recognition, which may easily lead to local structural errors, distortion of craftsmanship logic, stiff detail expression, and biased understanding of Chinese clothing cultural elements, pattern semantics, and the transmission of emotional value.^[16] Overall, current generative AI-assisted tools have become deeply embedded in the learning practice of fashion design-related courses. Nevertheless, their application remains concentrated mainly in course links such as visual generation, copywriting assistance, and preliminary data integration. Their use is still dominated by scattered functional calls, and the integration and full-process coordination of different AI tools within the course task chain have not yet been truly realized.

2.2. Student cognition level: Some students show result dependence, biased understanding of tool attributes, and insufficient awareness of ethical boundaries.

The widespread use of technology does not mean that students' understanding of AI has deepened at the same pace. At present, in university fashion design programs, cases are increasingly common in which students misuse AI-assisted software to produce rough "quick-generation" works merely to cope with design course assignments. Fundamentally, this is because students have developed deviations in their understanding of the functional attributes, role positioning, usage boundaries, behavioral patterns, and value concepts related to AI tools. Students become dependent on AI-generated results, excessively trust AI outputs, and regard them as final "finished products" rather than reference materials. Yet this mistake precisely obscures the double-edged nature of GenAI: GenAI may bring creative prosperity, but it may also induce "creative decline and intellectual homogenization." When designers become immersed in the generation of flawless images, they may also fall into the trap of "narcissistic introspection." In a teaching-experiment study on AI-empowered fashion design processes, scholars Rizzi and Bertola from Politecnico di Milano (2025) found that when students "blindly accept" AI-generated results, their design behavior directly weakens critical thinking and may even lead students to bypass the problem-analysis and learning processes they should have gone through^[17]. In addition, the biased positioning of AI tools confuses the essential difference between "technical assistance" and "technical substitution," thus triggering a cognitive crisis in the role positioning of designers. This cognitive bias stands in sharp contrast to the concept of the "cyborg designer 4.0" proposed by Särnkari and Vänskä (2022). The latter describes a design paradigm of deep human-machine integration and symbiotic enhancement, in which human-centered thinking makes the designer's value judgment and creative sovereignty the core driving force for steering AI^[18]. The authenticity and ethical risks of AI-generated content have always been major hidden dangers in the process of design practice. Some students lack awareness of the ethical boundaries of AI use and directly use generated content as a substitute for market research, competitor analysis, industry status research, and market analysis. This causes subsequent brand positioning, product combinations, and communication strategies to be built on unverified information, ultimately leading to biased planning judgments.

2.3. Thinking guidance level: Efficient generation compresses the thinking chain of brand planning and weakens experiential learning and the judgment process in the early and middle stages of design.

The *Fashion Brand and Merchandise Planning* course is a core course for fashion design majors and is characterized by strategy, systematicness, and forward-looking orientation. Taking Beijing Institute of Fashion Technology as an example, the course requires students, by the end of the semester, to complete a full planning thinking chain covering "market insight–brand positioning–product architecture–visual presentation–marketing strategy." The core of this thinking chain is to cultivate students' ability to make effective front-end judgments about the market and consumers during fashion brand planning, as well as their ability to execute back-end product design presentation and brand marketing communication plans. However, after AIGC intervenes, the efficiency of technological output can easily shift course learning from "process construction based on problems" to "rapid assembly based on results." Generally speaking, experienced designers often compress and internalize the early design process in practice by relying on "design intuition and experience." However, this "intuition" does not emerge out of thin air; it comes from long-term and complete training in design thinking. The acceleration effect of AI tools deprives design beginners of the process of cognitive accumulation, making them more likely to fall into a cognitive gap in which they "understand the tool but do not know how to create"^[19]. In addition, blindly using AI generation in every design stage may cause students to neglect experiential learning channels through which inspiration is drawn from life. Specifically, in the *Fashion Brand and Merchandise Planning* course, the main thinking pitfalls are concentrated in three links: "problem definition," "information discernment," and "value judgment."

First, in the early stage of brand planning, students should conduct research, comparison, and deduction around target market selection, identification of consumer pain points, and directions of brand differentiation. In reality, however, some students directly use AI to generate seemingly complete brand analyses, consumer profiles, and market conclusions. This practice skips the process of "raising questions–forming judgments" that they should have experienced. The University of the Arts London also clearly reminds educators in its teaching stance on "AI and Assessment" that, to prevent students from "bypassing the learning process," some course learning tasks should be explicitly labeled as prohibiting AI use^[28]. (Figure 4) At the same time, the black-box-style integration of AI tools and their "definitive outputs" create an illusion that "the conclusion has already been verified"^[29]. Because of the lack of thinking guidance, students easily accept these conclusions and eventually neglect the

core abilities emphasized by the course: cross-verification of multi-source information, identification of contradictions, and judgment of authenticity. A deeper problem appears in the stage of value judgment. The key to a fashion brand planning course lies in training students to make trade-offs, establish priorities, and coordinate different directions around the brand's core values. [20] Beginners easily understand the learning process of planning as the juxtaposition and splicing of multiple AI-generated "beautiful concepts." Although AI's efficient generation expands the space for scheme design, it also weakens students' training in value judgment regarding scheme priorities, resource allocation, product structure, and the long-term logic of the brand.

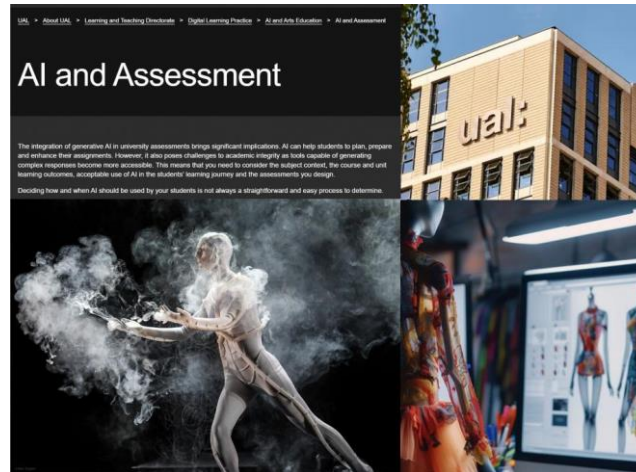


Figure 4. Official AI guidelines and AI activity poster on the University of the Arts London website.

2.4. Teaching mechanism level: An AI-integrated teaching mechanism, evaluation standards, and resource ecology oriented toward the task chain have not yet been formed.

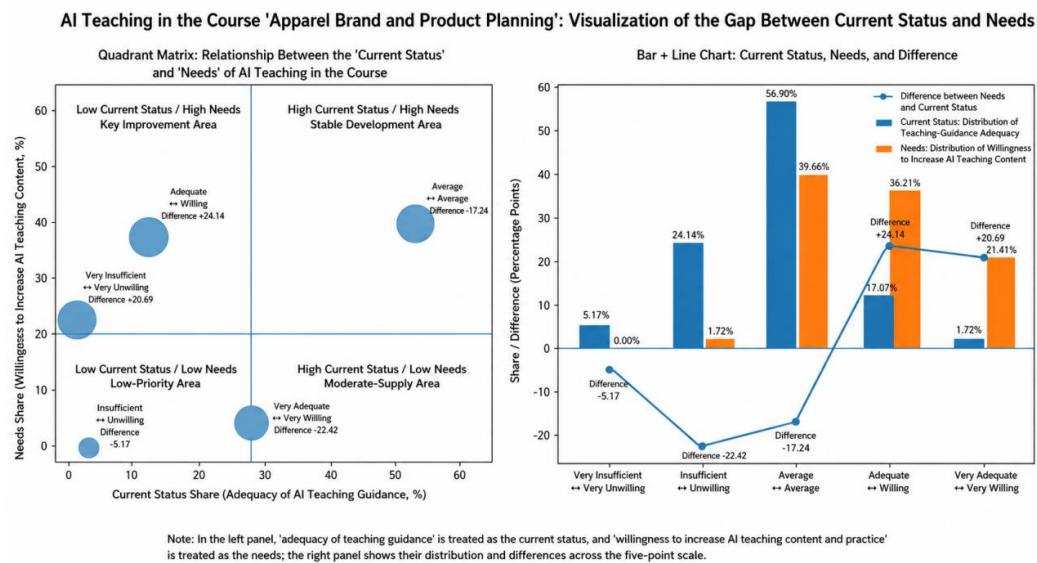


Figure 5. Gap analysis between the current state of AI teaching and students' needs.

Compared with the rapid expansion of AI-assisted tool applications, institutional responses to AI integration in fashion design education have clearly lagged behind. Specifically, at the level of the teaching mechanism for the *Fashion Brand and Merchandise Planning* course, a systematic teaching framework deeply aligned with AIGC technology has not yet been formed. In the gap analysis between the current state of AI teaching and students' needs in the *Fashion Brand and Merchandise Planning* course for the womenswear direction at Beijing Institute of Fashion Technology (Figure 5), the largest proportion of students rated the current AI teaching guidance as "average," accounting for 56.90%, while 22.41% of students expressed strong expectations for adding AI guidance to the course. This survey result reveals a transitional teaching state in which AI integration in the *Fashion Brand and Merchandise Planning* course has "entered the classroom but not yet formed a system." Subsequent

course reform should not only add instruction on AI tools, but should also strengthen AI task guidance, operational demonstrations, project embedding, and process feedback. Rizzi and Bertola (2025) pointed out in their study that the current integration of GenAI into fashion design processes has not yet reached a task-chain-oriented systematic level.^[17] The use of AI still shows characteristics of a “scattered and initial stage” and “piecemeal application.” Technical University of Munich (TUM) scholar Katja Thoring also proposed at the ICED23 conference that, based on current typologies of design knowledge and the concept of evolutionary creativity, the academic consensus at this stage is that AI tools in design practice are highly “context-dependent,” rather than being embedded through a unified and systematic process.^[30]

This “scattered invocation” and “context-dependent” use of AI tools poses a direct challenge to the existing result-oriented evaluation system of the course. Traditional result-oriented evaluation faces difficulties after the intervention of AIGC. AI can generate high-quality assignments in an extremely short time, causing pure “result evaluation” to lose its effectiveness in distinguishing quality. Kadel and other scholars from RMIT pointed out that in the GenAI era, the inability to identify whether a product was directly generated by AI has triggered concerns about product authenticity, academic integrity, and learning verification. Therefore, the course evaluation system urgently needs to shift from “result-oriented” to “process-oriented” evaluation to adapt to the new teaching form after AI intervention.

3. Theoretical Basis and Goal Reconstruction for the Teaching Reform of AIGC Intervention in the *Fashion Brand and Merchandise Planning* Course from the Perspective of Symbiosis Theory

Although research related to the practice of AIGC intervention in the teaching reform of design courses has become increasingly rich, most studies still follow a “different courses + AIGC” approach based on “tool embedding.” They focus on how to introduce generative AI into existing teaching processes to improve content-production efficiency or enrich presentation forms. However, these studies remain at the micro-level perspective of innovative tool use and do not touch upon the deeper problems and contradictions inherent in the digital-intelligent transformation of courses. This paper attempts to discuss, from the perspective of symbiosis theory, the relationship reconstruction and new course objectives involved in the teaching reform of AI-assisted *Fashion Brand and Merchandise Planning*.

3.1. Theoretical basis for teaching reform of the *Fashion Brand and Merchandise Planning* course from the perspective of symbiosis theory

“Symbiosis” was originally a biological concept proposed by the German biologist de Bary in the nineteenth century to describe relationships of co-living among different species. Later, the concept was gradually introduced into the fields of social sciences, architecture, and design. In works such as *The Philosophy of Symbiosis*, Kisho Kurokawa understood symbiosis as a design thought and philosophy involving the dynamic coexistence and transformation of seemingly opposing factors such as heterogeneous cultures, humans and technology, interior and exterior, parts and wholes, and history and the future.^[27] Professor Liu Guanzhong of Tsinghua University combined the idea of symbiosis with local reflections on design philosophy and proposed the design-philosophical concept of “symbiotic aesthetics,” which emphasizes the symbiosis of multiple subjects.^[21] Symbiosis theory stresses that heterogeneous subjects form new relational structures through interaction, checks and balances, and collaboration. Its core does not lie in the superficial and empty concept of “harmonious coexistence,” but in deep value interaction, interdependence, collaboration, and co-construction. At present, academia still lacks a systematic relational analysis framework and operational pathway for conducting teaching-practice research in design courses based on symbiosis theory. Therefore, before carrying out the teaching design reform practice of AIGC-assisted *Fashion Brand and Merchandise Planning*, it is necessary to regard teachers, students, technical tools, course tasks, and industrial contexts as a course symbiotic system, to analyze the internal relationship mechanisms in advance, and to clarify the connection logic and operating modes among different elements.

Drawing on the relational explanatory perspective of Kisho Kurokawa’s philosophy of symbiosis and combining it with systematic analytical thinking in design studies, the author analyzes the reconstruction of teaching relationships after AIGC intervention in related courses from four core dimensions: interactive association, dependency coupling, synergistic enhancement, and co-constructed generation. The dimension of interactive association emphasizes the process of interaction and information flow among multiple subjects in the course, including teachers, students, technical tools,

and the industrial environment. These subjects engage in continuous real-time interaction and dynamic coupling through a “symbiotic interface.” Analysis at this dimension can transform the course into a relational system involving multiple subjects and continuous feedback, thereby providing a basis for task linkage, role division, and feedback regulation in subsequent teaching pathway design. The dimension of dependency coupling focuses on the mutual dependence among teachers, students, technical tools, and course tasks, enabling the functional roles of different subjects to be consciously connected and coordinated, and providing internal support for the implementation of course objectives, the progressive development of competency levels, and the operation of the task system. The dimension of synergistic enhancement focuses on the functional division of labor, modes of collaboration, and overall effectiveness among subjects in the course system. It emphasizes that teachers, students, technical tools, and course tasks do not simply coexist; rather, they form an overall synergistic relationship through reasonable division of labor and functional complementarity. This guides course operation away from an imbalanced state in which “generated results replace the thinking process” and toward a collaborative generation mechanism in which “human creativity leads and AI efficiency empowers.” The dimension of co-constructed generation focuses on the new forms of knowledge, competency structures, task organization methods, and evaluation mechanisms generated through continuous interaction and collaboration within the course system. ^[22]For the *Fashion Brand and Merchandise Planning* course, the focus of this course reform is no longer merely the outcome of individual assignments, but the “future fashion scenarios” co-generated with industry trends, brand culture, and social needs, thereby reflecting a deeper symbiotic relationship between humans and technology as well as between humans and society (Figure 6).

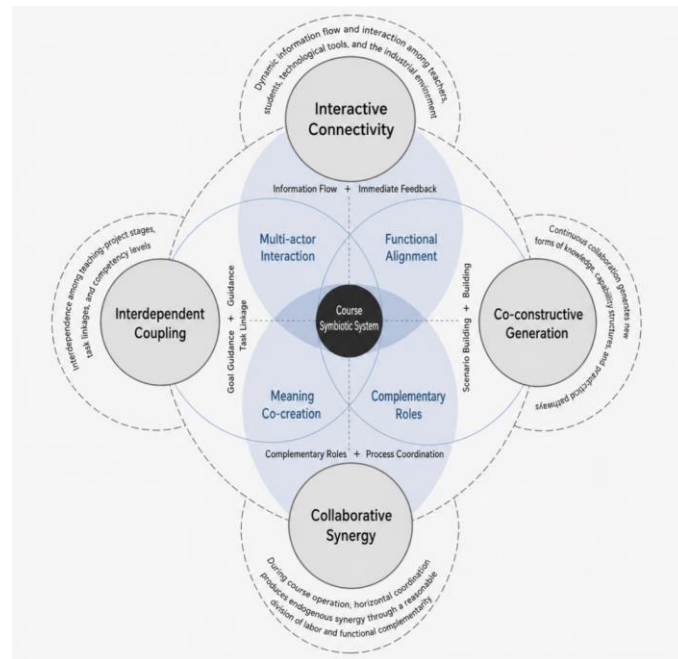


Figure 6. Symbiotic system model for the reconstruction of teaching relationships after AIGC intervention in the *Fashion Brand and Merchandise Planning* course.

3.2. Goal reconstruction for the teaching reform of AIGC-assisted *Fashion Brand and Merchandise Planning*

For a long time, the teaching objectives of the *Fashion Brand and Merchandise Planning* course in university fashion programs have mainly focused on cultivating students' mastery of brand-planning knowledge, market-analysis ability, product-series planning ability, and visual-presentation ability. Traditional course objectives have mostly revolved around a linear product development process and static brand-planning documentation. A related report released by the global consulting firm McKinsey in 2023 pointed out that the operational logic of fashion merchandising is increasingly based on consumer insights, brand narratives, data analysis, and collaborative decision-making. ^[23]In recent years, the development of generative AI technology has gradually transformed these work links into new processes characterized by “data analysis–generation assistance–collaborative judgment.” In their latest research, Swiss scholars Espejo Mendez and others noted that in the future AI era, personnel in positions related to fashion design and planning will need three core competencies: information

verification ability, prompt-engineering ability for using AI tools, and critical thinking for judging the suitability of generated content.^[31] It can thus be seen that AIGC technology is fundamentally reshaping the teaching logic and objective positioning of the *Fashion Brand and Merchandise Planning* course.

This study proposes a three-level progressive teaching-to-job competency mapping framework and course objectives: “front-end cognition + mid-end translation + back-end feedback.” First is the front-end composite ability of judgment regarding market and brand knowledge. Driven by the powerful generation capacity of AIGC, the basic course knowledge that previously depended on teacher instruction and repeated student consultation has gradually been transformed into integrated information resources that can be quickly obtained and organized with the help of AI tools. Therefore, the front-end teaching focus of the *Fashion Brand and Merchandise Planning* course shifts from traditional “knowledge transmission” to “the construction of composite abilities.” In other words, it no longer stops at memorized mastery of market, brand, and product knowledge; rather, it focuses on cultivating students’ comprehensive judgment literacy in screening and verifying market data, brand information, consumer insights, and trend content; cross-checking and integrating such information; and, on this basis, completing planning decisions related to brand positioning, target-consumer profiles, product theme setting, and series-structure judgment.^[24]

Second is the mid-end transformation ability that upgrades from “tool adaptation” to “value creation.” In the mid-stage translation and innovation process of design course teaching, the ability to adapt to tools has always been closely related to learning. However, in different eras, the technological connotations and teaching orientations carried by tool innovation continue to change. Based on this, the reconstruction of mid-end teaching objectives should shift from “tool adaptation” to “value creation,” that is, cultivating students’ ability to use AIGC to further translate brand positioning, consumer needs, and product themes into merchandise plans, visual proposals, and communication content.^[25] Specifically, at the technical level, teaching should focus on training students’ ability in instruction design and result optimization, including writing precise and iterable prompts, adjusting parameters, comparing multiple rounds of generation, and selecting and integrating results. At the humanistic level, it should strengthen students’ creative speculation and aesthetic judgment, enabling them to make professional judgments about the novelty, suitability, and expressive quality of AI-generated content based on brand tone, cultural context, and user needs, thereby preventing technology from replacing humanistic thinking.

Finally, the back-end goal is to develop sustainable full-process abilities in human-AI collaboration and feedback optimization. After AIGC assists the *Fashion Brand and Merchandise Planning* course, the teaching objectives should be grounded in the construction of full-process autonomous learning pathways, the holistic nature of education, and the reconstruction of human-AI collaboration mechanisms. Some scholars have pointed out that design education in the AIGC era is shifting from the traditional dual structure of “teacher-student” to a triadic knowledge co-creation pathway of “teacher-student-AI.” The back-end teaching focus of the course is to incorporate presentation, process documentation, feedback analysis, scheme revision, and reflective optimization into a continuous iterative learning loop. On the one hand, this cultivates students’ ability to interpret feedback, track processes, and continuously optimize after outputting brand schemes.^[26] On the other hand, it strengthens their awareness of boundaries, sense of responsibility, and sustainable learning ability within the symbiotic collaborative mechanism of “teacher guidance–student leadership–AI assistance,” so that AIGC truly serves the formation of students’ innovative thinking, social responsibility, and long-term development ability, rather than becoming a shortcut tool that replaces thinking.

4. Design of a Symbiotic Interactive Teaching Pathway for AIGC-Assisted *Fashion Brand and Merchandise Planning*

Taking the *Fashion Brand and Merchandise Planning* course in fashion programs at higher education institutions as the object of practice, this study designs an AIGC-assisted course teaching pathway around a seven-week teaching cycle. Supported by symbiosis theory, the study translates the collaborative relationships among teacher guidance, student judgment, technological assistance, market context, and course tasks into executable teaching links and stage outcomes. It thereby forms a new AI-assisted teaching pathway: market decoding, brand co-construction, merchandise translation, and feedback iteration (Figure 7). The core purpose of this pathway is to establish a reasonable division of labor between humans and machines through course teaching design, so that AI tools can assume auxiliary functions in links such as information support, initial draft generation, visual translation, and

feedback analysis. In this way, the course can shift from chaotic, fragmented AI-tool invocation to orderly task collaboration through chain-like human-machine interaction.

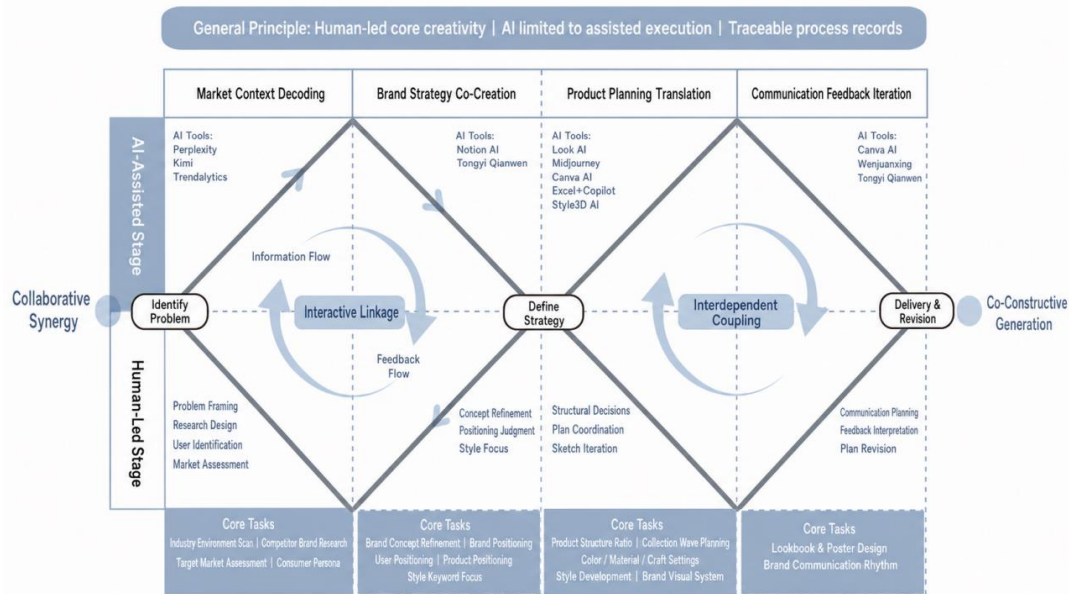


Figure 7. Double-diamond four-stage teaching pathway for AIGC-assisted Fashion Brand and Merchandise Planning based on symbiosis theory.

4.1. Market-context decoding: Identifying industry trends and consumer needs based on AIGC

In the market decoding stage, students need to systematically master basic theoretical knowledge of the apparel industry environment, the current state of womenswear brands, and design trends. On this basis, they conduct market analysis and preliminary brand research. In this stage, AI tools play the role of “information collection assistants,” mainly undertaking auxiliary functions such as extracting summaries from industry reports, integrating trend data, collecting information, and conducting preliminary visual analysis. During class, teachers recommend AI software in a targeted manner according to different teaching tasks. For example, students may use AI tools such as Perplexity, Kimi, and Tongyi Qianwen to quickly retrieve industry reports, and use LOOKAI and WGSN AI to summarize trend data, thereby helping students build an information-cognition framework connected with the real market environment. At the same time, key content such as market research report summaries, questionnaire design, consumer-profile sketches, and problem-list organization must still be completed independently by students on the basis of manual analysis. Through multidirectional interaction among teacher guidance, student leadership, AI assistance, and industrial information feedback, this stage ultimately realizes the transition from broad market information collection to focused identification of brand problems, providing authentic and verifiable analytical evidence for subsequent brand co-construction.

4.2. Brand-strategy co-construction: Generating brand positioning and planning logic under human leadership

The teaching focus of the brand co-construction stage is to guide students, on the basis of preliminary market research and problem identification, to further extract the brand’s core values and generate planning logic. The course focuses on building an AI-assisted learning system around brand philosophy, product positioning, consumer positioning, and style positioning. Through continuous classroom discussion and staged presentations, students need to transform AI-generated information into planning evidence that can be discerned, selected, and argued for, while always maintaining their agency in independent judgment and value-based decision-making regarding brand construction logic. In this link, teachers clearly define the boundaries for AI-assisted tools according to different teaching contents, so that AI mainly plays auxiliary roles in knowledge organization, language polishing, and expression support, rather than replacing students’ planning judgment and creative generation.

Specifically, the AI-assisted course task-chain output at this stage mainly includes two modules. The first is the generation of textual planning content around brand philosophy, product positioning,

consumer positioning, and style positioning, involving the planning of the brand's core concept, slogan, style keywords, and overall planning logic. Students may use tools such as Tongyi Qianwen, Kimi, and Notion AI to summarize competitor information, generate user-profile templates, associate brand keywords, and preliminarily organize planning texts. However, the above core content must be based on students' independent analysis and human judgment, and AI-generated texts may only serve as references. The second module is reference generation for brand image, packaging visuals, and style direction. Students may use tools such as Midjourney, LOOKAI, and Canva AI for auxiliary expression, but all visual outcomes must be premised on students' hand-drawn sketches or preliminary layout concepts. The final schemes must also undergo manual screening, revision, and reorganization, and must not be generated out of thin air outside the original planning logic, so as to ensure that visual expression truly responds to the brand tone and planning objectives.

Meanwhile, in the course assignment practice, students are required to retain process materials such as "manual concept sketches—records of AI-assisted optimization—manual final drafts—explanations of revision logic." The purpose is to transform the originally implicit planning thinking, comparison process, and value trade-offs into visible, traceable, and analyzable learning evidence. This stage promotes a symbiotic evolution of brand-planning ability between students and AI through continuous information transformation, value judgment, and process documentation. In mutual interdependence, the two sides jointly construct brand logic, making the learning process a carrier of meaning generation through human-AI collaboration and value co-creation.

4.3. Merchandise translation: Product development and visual expression assisted by AIGC

The merchandise-translation stage performs the key function of transitioning from brand logic to a product system. The teaching focus of this stage revolves around instructional content design for product-structure planning, target-season theme proposals, launch-wave scheduling, and specific product design and development in a real market context. The course emphasizes that students should establish a continuous design-translation relationship among brand logic, market demand, and product expression. As an auxiliary medium for organizing product development structures and supporting design expression, AIGC mainly undertakes functions such as scheme visualization, structural organization, timeline assistance, product-inspiration expansion, and support for effect presentation at this stage.

Specifically, at the level of planning texts and product-structure planning, students use AI-assisted tools such as Excel + Copilot, Notion AI, and Tongyi Qianwen to complete preliminary information organization, including product launch-wave planning, simulated sales data, product development timelines, initial Gantt charts, and copywriting polishing. However, product proportions and combination logic, price bands, launch-wave rhythms, and channel strategies must be deduced and decided manually by students. At the level of product design translation and visual development, students use tools such as LOOKAI, Midjourney, and Style3D to assist in generating theme boards, color matching, inspiration for fabric combinations, style drawings and craftsmanship-detail expression, and material-texture exploration. Nevertheless, the validity of these AI-generated outputs is always premised on students' original concepts formed through life observation, hand-drawn sketches, or draping experiments. At the same time, the course treats real-life experience and embodied fashion design practice as the original basis for product decisions and as core requirements for assignments. Students are required to retain process materials such as "records of inspiration collection from life—manual theme proposals—AI-assisted generation processes—manually revised final drafts—explanations of revision logic." The purpose is to make the human-AI collaborative thinking chain in merchandise-translation explicit, procedural, and traceable, thereby helping students gradually develop product-integration ability and collaborative translation ability oriented toward real market contexts.

4.4. Communication-feedback iteration: A scheme revision loop based on research and evaluation

The feedback iteration stage constitutes the concluding stage of the teaching design for the *Fashion Brand and Merchandise Planning* course. It is also an important point at which earlier planning content enters real feedback validation. At this stage, the course requires students to complete brand image promotion for the target season, planning of visual marketing content, user research and analysis of communication-effect feedback, and scheme revision. This link requires students to establish a continuous iterative update relationship among brand expression, communication strategies, and user feedback, so that the planning scheme can move through a dynamic cycle from "proposal" to "verification" and then to "optimization."

In this stage, AIGC is embedded as an auxiliary medium for generating communication content and organizing feedback information in the output, analysis, and optimization of brand communication schemes. First, at the level of communication content design, teachers guide students in class to use tools such as Canva AI and LOOKAI to assist in generating initial drafts of brand posters, promotional visuals, lookbooks, and social media images and texts, thereby improving the efficiency of auxiliary decision-making for communication schemes. At the level of feedback analysis, AI-assisted sentiment and semantic analysis systems can identify links of “information gaps” between communication content and audiences. The teaching design further guides students to combine Wenjuanxing and Tongyi Qianwen to conduct preliminary organization, semantic summarization, and opinion aggregation of target-customer research data for students’ course assignments on “brand planning and series womenswear design drawings,” thereby forming staged judgments about communication effects and user cognition. On this basis, the course further integrates questionnaire feedback, semantic analysis, and group discussion, incorporating user-opinion identification, communication-problem diagnosis, and scheme adjustment into the iteration chain of brand planning schemes. This ensures that communication optimization is based on real feedback, independent analysis, and human judgment, rather than merely accepting AI-generated conclusions directly.

5. Conclusion and Reflection

At present, as generative AI continues to penetrate design education and the fashion industry, the frequent and widespread use of AIGC tools among design students has prompted design-education researchers to reflect deeply on teaching design, usage guidance, and other aspects of AI-assisted courses. Taking the teaching practice of the AI-assisted *Fashion Brand and Merchandise Planning* course in higher education as its research object, this paper focuses on the problems triggered by AIGC intervention in the course, including fragmented invocation of AI tools, blurred boundaries of design agency, and weakened planning judgment among students. The study introduces symbiosis theory as the theoretical framework for course teaching design reform and aims to construct a four-stage symbiotic AI-assisted teaching pathway comprising market decoding, brand co-construction, merchandise translation, and feedback iteration. The study shows that the four-stage symbiotic teaching pathway can effectively solve the problem of embedding AIGC into the course as auxiliary guidance for information support, structural organization, visual translation, and feedback analysis. At the same time, the perspective of symbiosis theory helps transform the originally loose relationships among teachers, students, technical tools, and market contexts into a collaborative structure with task chains, boundaries, and feedback.

Although the study provides an operable pathway paradigm for integrating AIGC into university brand-planning courses and offers a practical foundation for an attempted shift in AI-assisted course evaluation from “result-oriented” assessment to an approach that gives equal weight to “process evidence + cognitive basis,” the risks of “cognitive dependence” and the tendency for “speed to overwhelm reflection” brought by AIGC-assisted tools have not been effectively alleviated. The convenience of technology still covertly affects students’ process of deep thinking. The application guideline of “process evidence + cognitive basis” for AI teaching evaluation has become an academic consensus. However, in specific teaching practice, how to design operable process-evaluation indicators and how to effectively implement process-documentation verification at class scale remain practical problems that need to be solved.

Looking ahead, research on AIGC-assisted *Fashion Brand and Merchandise Planning* courses will shift toward the construction of more refined collaboration mechanisms, more stable process-evaluation systems, and longer-term ethical-norm frameworks. On this basis, AI will be further promoted from functional embedding toward more stable course integration, enabling it to release the potential of creativity enhancement and educational empowerment in the digital age and to provide sustained momentum for the digital-intelligent transformation of university brand-planning courses.

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